

Company Overview | Kiernan Structural Steel Limited | kssl.ie



Kiernan Structural Steel Limited (KSSL) is a family business that was established in 1989 by husband and wife team, Frank and Dolores Kiernan. Starting from very humble beginnings by manufacturing agricultural sheds, KSSL has become one of Ireland's leading structural steel firms from its modern Longford-based plant. KSSL provides a wide range of services to the steel construction industry, including projects where clients request value engineering for their structural steelwork.

Our services include:

- Design Engineering
- Steel Fabrication
- Steel Erection
- Cladding & Roof Metal Decking
- Floor Metal Decking & Welded Shear Studding
- Castellated Beams & Steel Trusses Manufacture
- Fire Protection Painting

Authors



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Overview & Background to the Lean Initiative

This project was undertaken to improve the transfer of information across projects and departments, and to move away from a reliance on paper. The approach taken to the project was to use the A3 problem solving methodology and a cross-functional team for Kaizen events for the roll-out of process changes. A broad array of Lean tools was deployed. Issues were identified and countermeasures were implemented to eliminate waste and improve the utilisation of the safety, environmental, and tendering team's time.

The net potential saving of €13,735 through time savings from the introduction of the electronic forms has also led to other savings not captured within this study, like, for

example, increased customer satisfaction and better quality control.

Whilst the primary goal of this project was the elimination of time waste and efficiency improvement through introduction of electronic forms, it also demonstrated the potential benefits that can be realised by applying Lean principles across the organisation – including in support departments. There remain some limitations to the use of the system, and some departments still have not been fully brought into the system, but it is undoubtedly a move in the right direction for the organisation and has realised significant gains.

Lean Initiative Undertaken – Lean Thinking, Tools, Techniques

The main focus of this project is the development of an electronic forms system to replace the company reliance on paper and the development of a means of speeding up information transfer and capture for use by the EHS Team as well as the Quality and Tendering Departments.

In his role as Health, Safety, Environmental, Quality (HSEQ) Manager, Peter, as the primary driver of this project, began the process by researching the various options available for the creation and management of electronic forms. This research involved engagement with industry peers to understand what other contractors in the same working environment as KSSL were using to see if we could learn from their

experiences to speed up our process.

From initial discussions, it was discovered that many contractors were using the same programme, and thus we downloaded and trialled it too. However, after some testing of that programme, it was found that although the app had many good features, it also had some fundamental flaws from a quality perspective. For example, a user could create a template for use – say, a weekly safety checklist – but in order to share this template with their fellow teammates, this document

had to be uploaded to a public library which meant anyone with the same app could access the template for their own use. That template, once downloaded by a teammate, could then be further altered which rendered document control meaningless, and therefore that programme was ruled out as a potential solution.

Other apps were trialled with similar results and/or limitations, until we discovered the GoFormz app. Following an initial trial of this app, we felt that many of the features needed were available in it, and so we proceeded to seek out examples of documents to demonstrate the potential time and effort savings.

We created several templates for simple and commonly-occurring checklists that were in regular use across all projects such as a 'Weekly Lifting Equipment Checklist' form and a 'Plant Safety Inspection' checklist, and uploaded these to the app. A meeting was arranged with members of the safety department where the app was debuted and its output analysed.

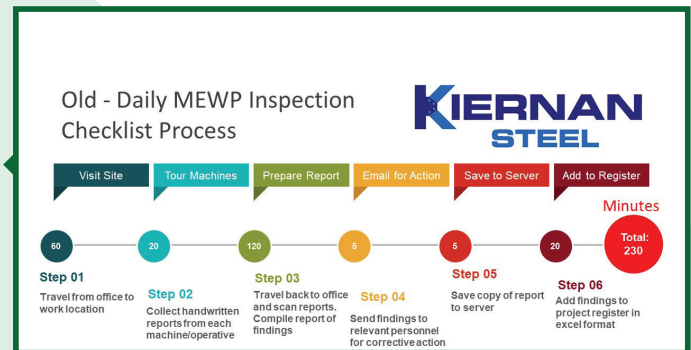
Several members of the team agreed to pilot the system on their projects, and subsequent amendments were made to the templates to improve functionality and speed up completion. The templates were designed so that typing would be minimal due to the small nature of the devices being used (phones and tablets), and so as much as possible the

checklists contained tick-box fields and drop-down menus. The app allowed for the introduction of automatically-populating data fields, direct inputting of images and sketches, and signature fields. When the templates were finalised, the trial began properly.

Throughout this improvement initiative, we followed the Kotter Change Model, particularly the steps such as 'create a vision for change' and 'create quick wins', and incorporated Ulrich's recommended steps of beginning any change with asking Who, Why, What, How.

As a starting point, we focused on Daily MEWP Inspection to determine the current state of reporting within the organisation. A standard template had been developed for capturing this information on projects, but it was in a WORD format that was freely adapted across each project. These forms were issued to the operators of the MEWPs (Mobile Elevated Work Platforms), who then had to fill in the forms by hand daily. These forms would then be collected by the Safety Team, and a report compiled. A process flow chart for the completion of a Daily MEWP Inspection was created using information recorded during site visits (Figure 1).

Figure 1.
Daily MEWP Inspections – Old Process



After completing the scoping exercise as outlined, we prepared and uploaded to GoFormz for completion of 'Daily MEWP Inspection'. A QR Code was also generated that linked to this form and for all users to access via their phones. Once the template was uploaded, we ran a training course with members of the Safety Team to demonstrate how the form was to be used on site.

Following on from this meeting, the template was amended following discussion to include additional information and automated workflows were set up to email the completed reports directly from the phone or tablet to selected personnel, as well as automatically generating an Excel report for administration staff. The discussions during this training also covered items such as the types of fields to be contained in the forms for rapid preparation of reports, such as drop-down menus, autofill dates, and checkboxes.

The further development of the system with the team moved towards the utilisation of the data source functionality within the system, which led to greatly reduced opportunities for error as one field could be used to populate the information in a consistent manner in many other fields and thus removing the potential for misspelling serial numbers as well as speeding up the entire process. A list of the specific details of each of the MEWPs on a pilot site were collected, as well as details of the different operators and their Safety Harness details.

| Plant No. | Make/Model | Serial No. | GA1 Expiry |
|-----------|----------------|-------------|------------|
| 9 | JLG 600 AJ | 300161044 | 23/07/2020 |
| 10 | Genie S65 | S6016M-194 | 25/07/2020 |
| 14 | Genie S65 | S6012-24057 | 16/11/2020 |
| 16 | Genie Z80 | Z8008-2296 | 19/08/2020 |
| 18 | JLG 800AJ-HS63 | 300272965 | 23/08/2020 |
| 21 | JLG 800AJ-HS34 | 300258184 | 04/09/2020 |
| 22 | JLG 800AJ-HS43 | 300258474 | 18/11/2020 |

Figure 2.
MEWP Data used for Report

Weekly meetings were scheduled to discuss the adoption of the forms across projects and the potential for new documents to develop. These meetings then moved to a monthly Skype call as the system became embedded.

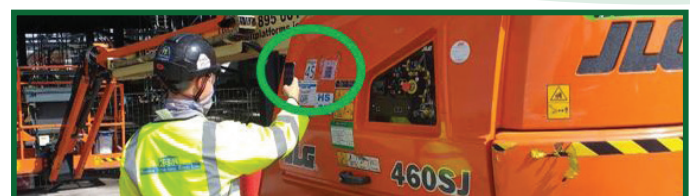


Figure 3.
Operative Using Phone to Scan QR Code

Lean Initiative Improvements & Impact

The results obtained during this programme of work have far exceeded the initial estimations considered, as the initial aim of the process was to focus on the safety and environmental teams but the system was adopted by other departments at a rapid rate. This has led to a far more widespread usage than initially imagined.

At the time of writing, the GoFormz system has 150 annual licences purchased. From this data, we were able to calculate the following results over a two-year period from November 2019 to August 2020:

- GoFormz User Licences: 6 licences at €1,800 annually
- Hardware Purchases: As the system can be used on Tablets, Smart Phones, and PCs, three refurbished iPads were purchased for site usage at a total cost of €665.
- Time Savings: Following discussion with the Payroll and Tendering departments, an average figure for professional staff of €45 per hour was agreed for use in calculations. It was calculated that over a period of 30 weeks, an average saving of two hours, per user, per week could be made by utilising the app correctly, leading to a total of 360 hours or €16,200 saved.
- This figure of 360 hours saved, minus the investment required for hardware and licences, led to a total saving over the 30-week reporting period of €13,735 (note that the 30-week period excludes the Covid-19 shutdown period).

In essence, KSSL's introduction of GoFormz has been one of the largest continuous improvement processes undertaken, and has assisted the company in propelling itself forward to a more modern era.

The study undertaken of the time spent on completing the Daily MEWP Inspections reduced the time taken to complete a form by up to 228-minutes for each report.

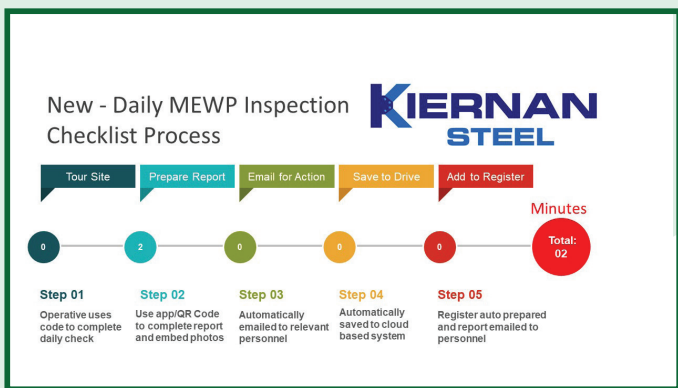


Figure 4.
New Time Spent on Daily Reports

An unexpected additional benefit of using GoFormz was that during the Covid-19 shutdown period, we needed to ensure that our staff were kept informed of return-to-work protocols. WhatsApp groups were being used on each

project to spread safety alerts and messages to all personnel, and this system was further optimised to send out the Covid Declaration forms to all of our workforce by texting them a link to the form. As the individual forms were completed, they were emailed to the C19 Officer, and a report was automatically generated from each form. This meant that a company-wide register could be collated prior to our sites recommencing.

Now that the system has been recognised as an effective tool for saving time and generating more professional and consistent information, its use is being expanded into other departments such as HR and Procurement. Our Quality Team also utilise the system to complete our RFT (Right First Time) forms which we use to track issues from design through to construction, and this enables a cost to be applied to any defect. The ultimate aim of this exercise is to measure our trends and generate meaningful data to focus our continual improvement efforts.

As noted in the McKinsey Global Institute Industry Digitisation Index 2015, and by many researchers, we need to imagine construction's digital future as the construction sector is amongst the least digitised. Thus, we went on to outline five big ideas for disrupting construction, and one of these five ideas is Digital Collaboration and Mobility which encompass the move towards paperless systems for real-time information transfer and analysis. KSSL feel that the introduction of this Lean initiative to the organisation has certainly helped move us in the right direction towards enhanced Digital Collaboration.

Figure 5.
Example of Completed Daily Form

